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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/749,370

12/31/2003

Andrea Rossi

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EXAMINER

FICK, ANTHONY D

ART UNIT

PAPER NUMBER

1753

MAIL DATE

DELIVERY MODE

08/09/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/749,370

**Applicant(s)**

ROSSI, ANDREA

**Examiner**

Anthony Fick

**Art Unit**

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/19/04</u>   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 9, 11, 13, 14, 15 and 17 through 19 are rejected under 35

U.S.C. 102(b) as being anticipated by Buist (U.S. 4,859,250).

Buist discloses a thermoelectric module as shown in figure 2a.

Regarding claim 1, figure 2a shows a thermoelectric module comprising a plurality of thermoelectric materials with opposed polarity, 30 and 32, connected by a first and a second conductive element, 26 and 28, wherein the materials are coating layers on at least one of the conductive elements (also see figure 2c and column 3 lines 3-8).

Regarding claims 9 and 11, Buist discloses the conductive elements are made of copper, aluminum or gold (column 2, lines 60-65) and figure 1a shows the conductive elements in the form of parallelepiped straps.

Regarding claim 13, figure 2a shows a plurality of modules which include a first conductive strap with a face coated by layers of thermoelectric material, 28 with 30 and 32 coating, and a second conductive strap for the electrical connection of such layers, 26, wherein the second strap is juxtaposed to the first strap to connect adjacent straps in series (see figure 2a).

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Regarding claim 14, figure 2a also shows the second strap not coated with the layers.

Regarding claim 15, Buist discloses means for heating and/or cooling straps (column 4, lines 46-52).

Regarding claims 17 and 18, figures 2c and 2d show a plurality of straps stacked one upon the other in an offset condition.

Regarding claim 19, Buist discloses means for heating and/or cooling straps (column 4, lines 46-52).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 through 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buist as applied to claims 1, 9, 11, 13, 14, 15 and 17 through 19 above.

The disclosure of Buist is as stated above for claims 1, 9, 11, 13, 14, 15 and 17 through 19.

Regarding claim 4, figure 2a also shows the coating layers coating the same area of the conductive element.

The difference between Buist and the claims is the requirement of specific thicknesses.

Buist does disclose the use of thick film or thin film thermoelectric structures (column 3, lines 5-8). The choice of the type of film and the exact thickness is dependent on the specific application. Absent any unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose a specific thickness for the device of Buist as within the claims.

5. Claims 5 through 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buist as applied to claims 1, 9, 11, 13, 14, 15 and 17 through 19 above, and further in view of Quillmann et al. (U.S. 4,472,347).

The disclosure of Buist is as stated above for claims 1, 9, 11, 13, 14, 15 and 17 through 19.

The difference between Buist and the claims is the requirement of specific thermoelectric materials.

Quillmann teaches a variety of thermoelectric materials that can be used to produce electricity from heat. The materials include platinum, tellurium, nickel, Ni-Cr and Ni-Cu (column 2, paragraph 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the thermoelectric materials such as the ones in Quillmann for use in the device of Buist because the selection of materials is dependent on the necessary thermoelectric voltage for the application (Quillmann column 2, paragraph 5) and one skilled in the art would be able choose such materials as within the claims for specific applications. Because these materials are all known within the

art to act as thermoelectric materials, one would have a reasonable expectation of success from the combination. Thus the combination meets the claims.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Buist as applied to claims 1, 9, 11, 13, 14, 15 and 17 through 19 above, and further in view of Ghoshal (U.S.P.G.Pub 2002/0092557).

The disclosure of Buist is as stated above for claims 1, 9, 11, 13, 14, 15 and 17 through 19.

The difference between Buist and claim 10 is the requirement of keeping the straps pressed against one another.

Ghoshal teaches a thermoelectric module as shown in figure 6. Ghoshal further teaches clamping the upper and lower substrates together to keep good contact between the thermoelectric material and the conductive metal tips.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize clamping as within Ghoshal within the devices of Buist to keep good contact between the straps because the clamping improves the electrical conduction between the thermoelectric element and the metal conductor. Because Buist and Ghoshal are both concerned with thermoelectric devices, one would have a reasonable expectation of success from the combination. Thus the combination meets the claim.

7. Claims 16 and 20 through 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buist as applied to claims 1, 9, 11, 13, 14, 15 and 17 through 19 above, and further in view of Hed (U.S. 5,228,923).

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The disclosure of Buist is as stated above for claims 1, 9, 11, 13, 14, 15 and 17 through 19.

The difference between Buist and claims 16 and 20 is the requirement of specific heating and cooling means. The differences between Buist and claims 21 through 28 involve the use of the modules on a nuclear fuel rod and the appropriate elements used to cover the nuclear fuel rod.

Hed teaches a cylindrical thermoelectric configuration as shown in figure 1. Hed further teaches a variety of heat sources including nuclear fuel rods as the central core (column 6, paragraph 1).

Regarding claims 16 and 20, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the heating and cooling means of the claims for the device of Buist because it is well known within the art to utilize a variety of different heating and cooling means to produce electricity and one would have a reasonable expectation of success from the combination.

Regarding claim 21, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the fuel and configuration of Hed for the device of Buist because the nuclear fuel rods allow for heat energy in space based applications where steam driven generators are not possible (Hed column 6, paragraph 1). Because Hed and Buist are both concerned with thermoelectric devices, one would have a reasonable expectation of success from the combination.

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Regarding claims 22 through 26, these limitations are well known in the art to produce power from nuclear fuel while providing protection from the radioactivity and would be obvious to one skilled in the art.

Regarding claim 28, the choice of strap cross sectional shape is dependent on the specific application. Absent any unexpected results, it would be obvious to one skilled in the art to select a specific shape as within the claim.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Fick whose telephone number is (571) 272-6393. The examiner can normally be reached on Monday - Friday 7 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.




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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anthony Fick  
AU 1753  
August 3, 2007

*ADF*

  
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